

Title (en)

Method and apparatus for investigating pipes with ultrasonic phased array sensors

Title (de)

Verfahren und Vorrichtung zum Untersuchen von Rohrleitungen mit Ultraschall-Gruppenstrahlern

Title (fr)

Procédure et appareil pour examiner des conduites par un réseau à commande de phase ultrasonique

Publication

**EP 1333277 A3 20041201 (DE)**

Application

**EP 03001421 A 20030122**

Priority

DE 10202432 A 20020122

Abstract (en)

[origin: EP1333277A2] Inspecting pipe wall of pipeline for defects involves controlling a portion of virtual sensors to irradiate ultrasound signals into the pipe wall at irradiation angle(s) which is inclined to a normal to the pipe wall, receiving ultrasound signals reflected by bordering surfaces of the pipe wall in the virtual sensors, and evaluating the received signals from differing bordering surfaces. Inspecting pipe wall of pipeline for defects involves: (a) introducing measuring sensors into the pipeline, each measuring sensor (16) comprising an array of controllable sensor elements; (b) defining virtual sensors, each virtual sensors comprising an array of neighboring sensor elements; (c) controlling at least a portion of the virtual sensors to irradiate ultrasound signals into the pipe wall at irradiation angle(s) which is inclined to a normal to the pipe wall; (d) receiving ultrasound signals reflected by bordering surfaces of the pipe wall in at least a portion of the virtual sensors; and (e) evaluating the received signals from differing bordering surfaces to determine pipe wall defects. An Independent claim is also included for a device for inspecting the pipe wall of a pipeline for defects.

IPC 1-7

**G01N 29/10**; **G01N 29/26**

IPC 8 full level

**G01N 29/07** (2006.01); **G01N 29/24** (2006.01); **G01N 29/26** (2006.01); **G01N 29/34** (2006.01)

CPC (source: EP US)

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Citation (search report)

- [XA] US 5454267 A 19951003 - MOREAU GEORGES [FR], et al
- [DX] EP 0255619 A2 19880210 - PIPETRONIX GMBH [DE], et al
- [A] US 5329930 A 19940719 - THOMAS III LEWIS J [US], et al
- [X] VOS H C L ET AL: "An ultrasonic circular array transducer for pipeline and borehole inspection", ULTRASONICS SYMPOSIUM 1988, 2 October 1988 (1988-10-02), pages 659 - 662, XP010075531

Cited by

WO2009087342A1; DE102006020352A1; BE1027961B1; DE102005016631B3; EP2105737A1; RU2485388C2; NO341773B1; BE1027962B1; US7690257B2; WO2021140117A1; US8201454B2; US8356518B2; US8776558B2; EP3865868A1; FR3107355A1; US11486861B2; WO2009120076A1; WO2007125308A3; WO2021140120A1

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DOCDB simple family (application)

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